Republic of Estonia
Ministry of Defence

Setting Transatlantic Defence up for Success:

A Military Strategy for Ukraine's Victory and Russia's Defeat

DISCUSSION PAPER

GLOSSARY

AFU	Armed Forces of Ukraine
ATACMS	Army Tactical Missile System
DCA	Defensive Counter Air
EUMAM	European Union Military Assistance Mission in support of Ukraine
EW	Electronic Warfare
GBAD	Ground-Based Air Defence
GMLRS	Guided Multiple Launch Rocket System
HIMARS	High Mobility Artillery Rocket System
IRIS-T SLM	InfraRed Imaging System Tail/Thrust Vector-Controlled, Surface-Launched Medium-Range
IRIS-T SLS	InfraRed Imaging System Tail/Thrust Vector-Controlled, Surface-Launched Short-Range
LRPF	Long-Range Precision Fires
MANPADS	Man-Portable Air-Defence Systems
NASAMS	National Advanced Surface-to-Air Missile System
R&D	Research & Development
RISS	Russia's Intelligence and Security Services
SAM	Surface-to-Air Missile
SAMP-T	*Sol-Air Moyenne-Portée/Terrestre,* Surface-to-Air Medium-Range/Land-Base
UAS	Unmanned Aerial System
UAV	Unmanned Aerial Vehicles
UDCG	Ukraine Defense Contact Group, also known as Ramstein Group or Ramstein Coalition
VKS	Воздушно-космические силы, Russian Aerospace Forces

Front cover: Steeplejacks wave the Ukrainian flag after finishing installing the coat of arms of Ukraine on the shield of the Motherland Monument in Kyiv, 6 August, 2023. The Ukrainian trident replaced the coat of arms of the former Soviet Union. Photo: AFP/Roman Pilipey

Ukrainian military training near the frontline in Donetsk. Photo: EPA/Yakiv Liashenko

In 1989, the fall of the Berlin Wall paved the way for a Europe 'whole, free, and at peace' – a vision set forth by President George H. W. Bush a few months earlier. The prospect that had been denied to generations before has thereafter evolved into the greatest success story for hundreds of millions of Europeans. Today, this very aspiration is at stake in Ukraine.

It is inherently simple to fall into a state of despair as Russia continues to wage its brutal war for the second year, with its appetite to inflict and sustain devastation seemingly endless and its war resources equally limitless. Shaping the information space in such a way is exactly what Russia is counting on – hoping to create gloom and defeatism amongst Ukrainians and their international supporters.

Let us not be misled that easily. It is we who have the upper hand in this fight.

Ukraine's victory and Russia's defeat in this war is achievable. In fact, this war can be won within the next three years or less, by adjusting and increasing the Euro-Atlantic community's military production output and assistance to Ukraine, and imposing the perspective of an intolerable level of attrition on Russia.

A renewed strategy for providing the Armed Forces of Ukraine the necessary training and military equipment will bring about the conditions for defeating Russia's imperialist theory of victory. With Ukraine's admirable fighting spirit and the transatlantic community's unparalleled military-technological advantage and resources, Ukraine's victory will come at a fraction of the cost in comparison to the alternative consequences.

A renewed strategy for providing the Armed Forces of Ukraine the necessary training and military equipment will bring about the conditions for defeating Russia's imperialist theory of victory.

Furthermore, accelerated and scaled-up investments into defence industrial production that are critical for Ukraine will fundamentally contribute to NATO's credibility, ability and readiness to provide for the deterrence and defence of the Euro-Atlantic area and beyond.

This military strategy will make way for a renewed and enduring vision of peace and strength, in conjunction with a revived Ukraine that is independent, sovereign, free in its entirety, and prospering as a fresh member of both the European Union and NATO.

Ending Russia's war in Ukraine with Ukraine's victory and Russia's defeat is the single possible first step towards this aim.

President George H. W. Bush delivering the speech that evoked a vision of Europe that would be "whole and free and at peace" in Mainz, Germany, 31 May, 1989. Photo: DPA/Alamy.

TACKLING THE ABUNDANCE OF THREATS

The global security environment is spiralling downwards at a rapid pace. Freedom and democracies are increasingly threatened across continents. The Euro-Atlantic community faces a multitude of crises, which are increasingly declining into security challenges, that neither the United States nor Europe could tackle alone.

The credibility, capability and readiness of our deterrence posture and forward defences bear an essential role that will likely be tested at an unprecedented scale by adversarial powers and non-state actors for years to come – also after the war in Ukraine.

Our efforts and resources must be mobilised to this end immediately, because each delay will be converted into a high price to be paid, when history stops being on our side. Every characteristic of this moment is being shaped on the vast battlefields in Ukraine.

Russia has a long-term objective of fundamentally reshaping the security landscape to its liking.

Russia remains the most significant and direct threat for Euro-Atlantic security. Russia has a long-term objective of fundamentally reshaping the security landscape to its liking. Russia continues to demonstrate its intent and readiness to fulfil this objective in words and deeds alike.

While exact estimates vary, there is general consensus that in the very short term (up to 2 years) Russia lacks the conventional capability required for escalating against NATO directly, because of its force degradation and commitments in the Ukrainian theatre. Furthermore, the Russian state has mobilised its defence industry at a scale unseen in decades to wage this war against Ukraine and the negative effects are clearly visible in the Russian state and defence budgets and the economic environment.

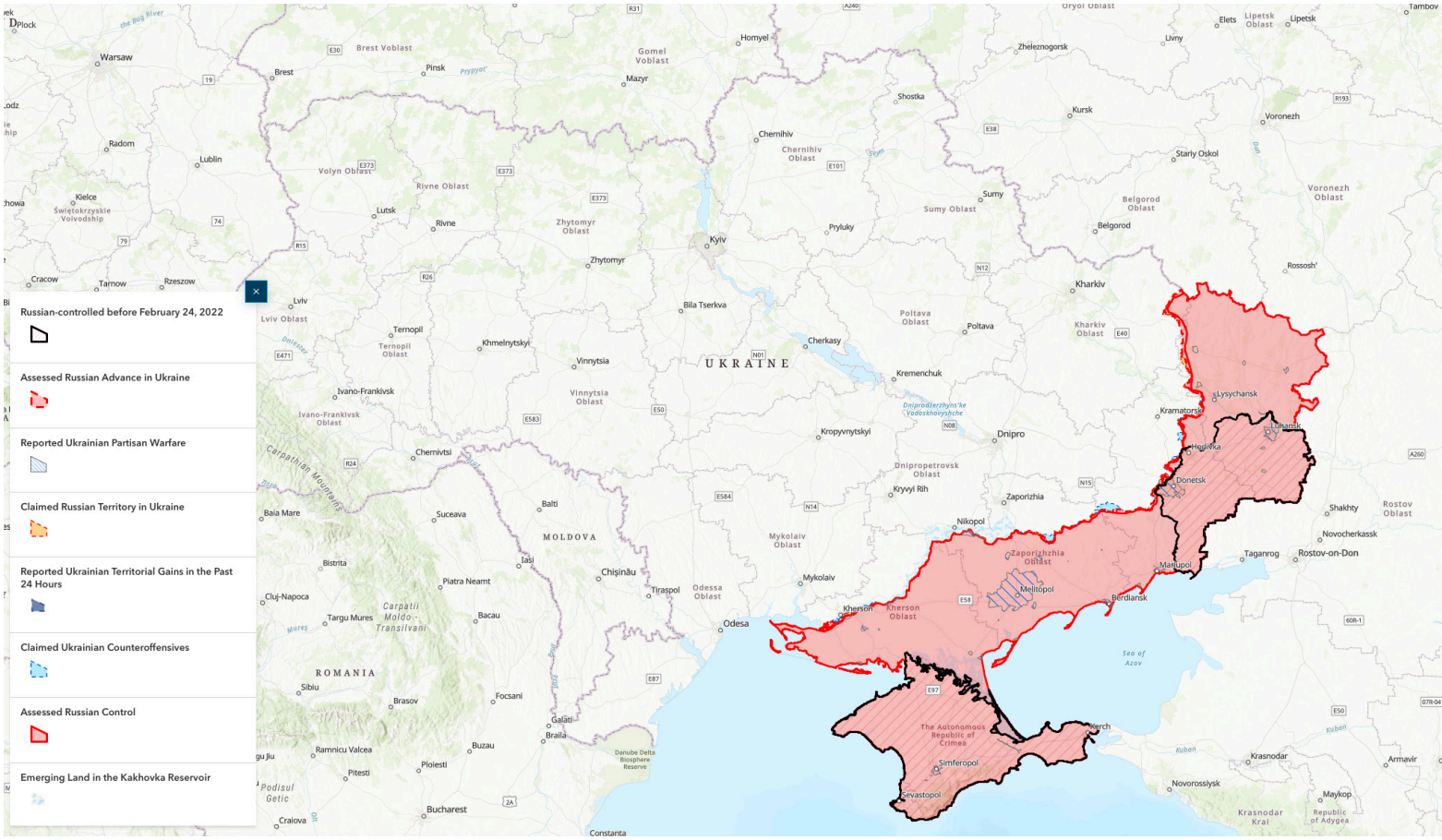
However, should Russia prevail in this war within the next 12-18 months, it would validate its assumptions about our collective weakness that can militarily be challenged and exploited in the short term (up to 5 years). Favourable global developments and opportunities for Russia can further expedite such negative scenarios.

WAR OF ATTRITION

Together with global partners, the Euro-Atlantic community has contributed remarkably towards supporting Ukraine. Yet, escalation concerns have guided us to a strategy of attrition that fundamentally hinges on strategic patience.[1] This war can be won on the battlefield, but only after we have convincingly excluded the viability of any theory of victory in the heads of the Kremlin regime. While Russia is still impervious to the logic of reason, it is continuously sensitive to the logic of force.

The Russian strategic objective in Ukraine remains the subjugation of the country. To this end, the Russian military is operationally pursuing five lines of effort against Ukraine.

1. *Prolonging the conflict.* After Russia's initial plan of a quick capture of Ukraine failed, the Armed Forces of the Russian Federation have been seeking to protract the conflict on the ground through the deliberate defence in depth of occupied terrain, comprising about 18% of Ukraine – an area that would span over two thirds of the Baltic states, and that is larger than the individual territories of more than 30 other countries in Europe. By fighting from prepared positions, Russia can ensure that Ukrainian territory would not be liberated rapidly, if at all, and only with a heavy expenditure of personnel and materiel.
2. *Expanding the occupied territory.* While Russian-controlled Ukrainian territory has more than doubled compared to 23 February 2022, from 42,000 km^2 to 108,000 km^2, Russia continues to attempt offensive operations with formed elements of its ground forces to try and further expand the occupied territories, at a minimum to the administrative borders of the annexed oblasts of Donetsk, Kherson, Luhansk and Zaporizhzhia. Ukraine's defences, Russia's limited training capacity and operational pressures have prevented these efforts from making headway, but attempts persist nevertheless. Russia has conquered more land in 2023 than it has lost[2].



Assessed Control of Terrain in Ukraine as of 13 December 2023. Map: Institute for the Study of War and AEI's Critical Threats Project

Firefighters work at a site of a critical power infrastructure object, hit during Russian drone attacks in Kyiv, Ukraine, 19 December, 2022. Photo: Press service of the State Emergency Service of Ukraine via REUTERS.

3. *Exhausting Ukraine's sustainability*. A sustained long-range precision strike campaign, combined with the intent to blockade and disrupt Ukraine's Black Sea ports, is aimed at the economic paralysis of Ukraine, making it almost entirely dependent upon its international partners.
4. *Destroying critical assets*. Russia conducts strikes against critical national infrastructure, with the aim of making Ukraine's cities uninhabitable in winter. Furthermore, the exhaustion of Ukraine's air defence network would allow the Russian Aerospace Forces (VKS[3]) to commence medium altitude bombing over the front, enabling the destruction of Ukrainian ground forces.
5. *Undermining resolve*. An unconventional campaign waged by Russia's Intelligence and Security Services (RISS) and cohered by the Centres of Special Influence under the Presidential Administration is orchestrating active measures aimed at undermining the political support for Ukraine among its international partners.[4]

Russia's regime remains confident that it has more resolve than we do, still believing it is able to outlast Ukraine and the Euro-Atlantic community. Whether this conviction is based on facts and analysis or fundamental misinformation is insignificant. It is clear that our strategy so far has not convinced the Russian regime in its cost-benefit calculation to bring them to the conclusion that they can only lose. As things stand:

1. The Russian military leadership assesses that it can sustain losses in fighting forces and military materiel for longer than the Armed Forces of Ukraine (AFU). Thus, even the ineptly executed operations will ultimately weaken and defeat Ukraine's ability to absorb Russian attacks indefinitely.
2. Russian industry, including in cooperation with other adversarial powers (notably Iran[5] and North Korea[6]), is aiming to outperform and outproduce the Western industrial base in the quantity of war materiel supplied. Mass matters, particularly when concerns about escalation risk and exposing technological advancements on the battlefield persist.
3. By protracting the conflict, Russia seeks to exhaust our collective will to support Ukraine. Deeming democracies an inherently inferior form of governance, the Kremlin regime is convinced that our centre of gravity – democratic unity – can be successfully challenged and defeated.
4. The long-range strike campaign is executed in the belief that Russian munitions will exhaust Western interceptors. Offensive, deep strike capabilities are inherently cheaper than defensive systems, while NATO Allies have reservations about providing them and capability gaps in both categories.

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U.S Secretary of Defense Lloyd Austin, center, delivers opening remarks during the 16th meeting of the Ukraine Defense Contact Group at NATO Headquarters, 11 October, 2023, Brussels, Belgium. Photo: Ukraine Presidency/Ukrainian Pre/Planet Pix via ZUMA Press Wire

5. By targeting these long-range strikes at civilian infrastructure, Russia aims to cause painful civilian losses, migration surges and social tensions. Russia is convinced that eventually the will and morale of the Ukrainian people would begin to break down and force the Ukrainian leadership to seek negotiations from a position of weakness, having no other choice than to make territorial and political concessions to Russia.
6. On the occupied territories, Russia's Intelligence and Security Services are conducting a brutal and methodical KGB-style repression campaign aimed at the liquidation of potential resistance cells, filtrating the population, suppressing any expression of Ukrainian culture, and progressively integrating occupied areas into Russia's domestic security and administrative structures[7].
7. Internationally, Russia is working to build an axis power of countries willing to work with the Kremlin in defiance of international sanctions. Further efforts are targeted at bringing about Western demand and pressure against Ukraine for ending the war.

SETTING UKRAINE UP FOR SUCCESS

We are in the midst of a battle of wills. Our strategic task is to change Russia's war calculation and remove any outlook for success via military force or diplomatic means at the expense of Ukraine. The prospect of Ukraine having no other choice than to negotiate with Russia from a position of weakness is not only daunting, but undercuts our values, interests and objectives.

It is pertinent to follow a renewed military strategy that will ensure Ukraine's victory, Russia's defeat, and sets the transatlantic defence up for success.

With decisive political will, we can afford to increase both military and economic pressure and bring attrition on the Russian side in the war against Ukraine to a breaking point.

We are larger than the task. The sheer size of our collective political, economic and military power should guarantee a victory over Russia. The Ukraine Defense Contact Group (UDCG), also known as the Ramstein group, has a combined GDP of €47 trillion. Total commitments of military aid to Ukraine[8] thus

People walk past a currency exchange office with an army recruiting billboard reading "Join your fellows", calling for a contract for service in the Russian armed forces in Moscow, Russia, 14 August, 2023. Photo: AP

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far are around €95 billion – 0.2% of that. At the same time, the combined defence budgets of the Ramstein coalition are more than 13 times greater than Russia's heavily inflated one: €1.24 trillion against €0.09 trillion in 2023. There should be no doubt in who has the advantage to prevail.

Waging the war in Ukraine costs Russia around a trillion rubles (€10.2 billion per current exchange rate) per month in military expenses alone. Assessments suggest that hidden war-related expenditures veiled under a variety of other categories in the federal budget could account for an extra 30% on top of this, co-funding by regions and private entities further adding to the total.[9] Meanwhile, the Ramstein coalition's monthly cost of military support averages at €5.3 billion (including still undelivered and multi-year commitments).

Russia's military budget for 2023, after being doubled mid-year, comprises a third of the entire federal budget. A similar share (29.4%) has been planned for military expenditure in 2024, effectively at the expense of essential state functions such as education, healthcare, infrastructure, and social policy.[10] Concurrently, the war effort is biting into Russia's National Wealth Fund reserves substantially and at a significant pace – and will almost certainly continue to do so as long as the war lasts. Given the setbacks in health and social sphere budgets as well as the announced increase of pensions[11], other federal funds such as The Pension Fund of the Russian Federation and The Federal Fund for Mandatory Medical Insurance are unlikely to provide any shelter for uncovered costs.

The international sanctions regime has limited Russia's access to additional financial instruments, reduced government revenues

Russia therefore increasingly faces the prospect of consistent and expanding war costs flooding the budgetary agenda under the conditions of rapidly declining resources and a very short stack of backup plans.

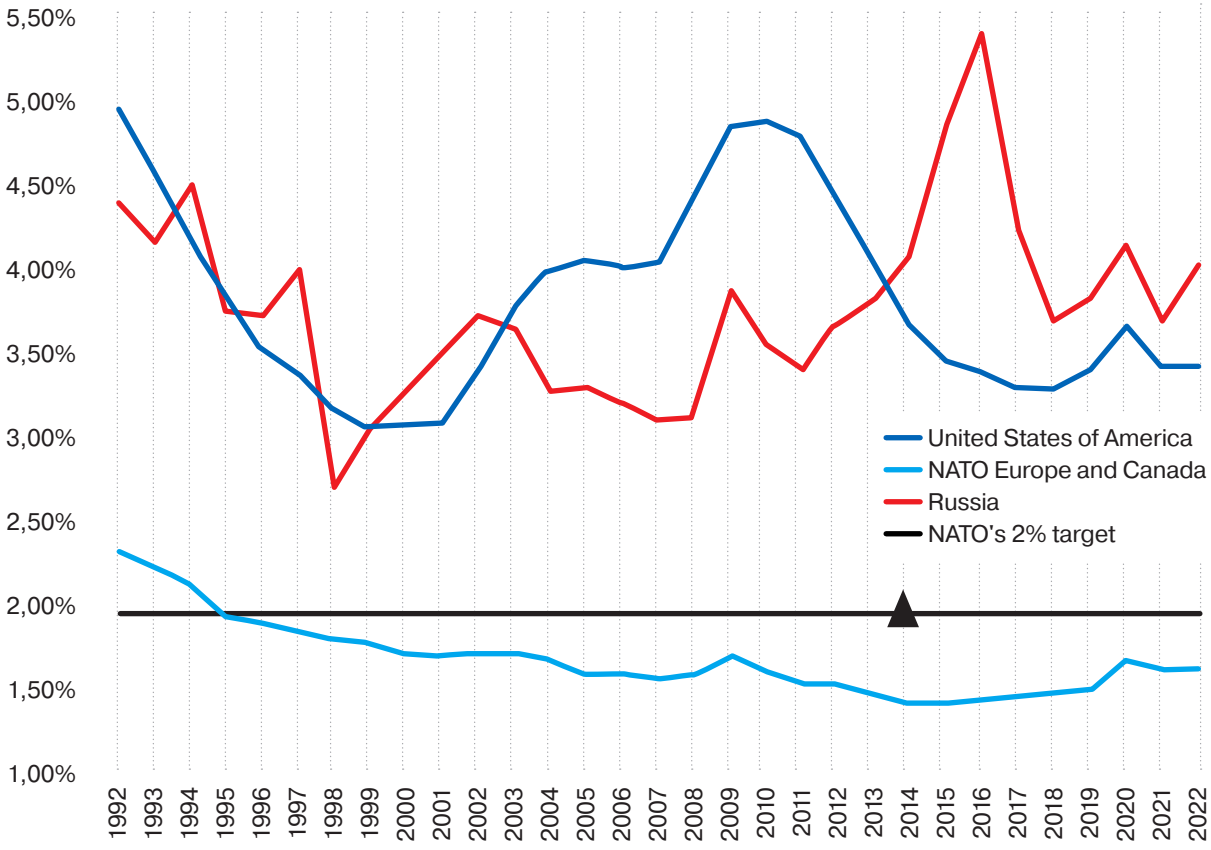
from key sources such as oil and gas, and could do more with enhanced targeting and enforcement. Russia therefore increasingly faces the prospect of consistent and expanding war costs flooding the budgetary agenda under the conditions of rapidly declining resources and a very short stack of backup plans. Internal means such as further cuts into budget sectors outside military needs, further tax increases and emissions of government bonds for the internal market or even bypassing the law to go for the central bank's reserves could provide temporary refuge, but would either risk straining the tolerance limits of the society or offer a short-lived extra resource.

By credibly preparing and signalling readiness for a long war and boosting our support to Ukraine accordingly, the sustained war cost and particularly its enduring outlook for Russia can be raised to the level, where it becomes intolerable for the Kremlin. The stronger Ukraine is, the sooner this tipping point could be reached.

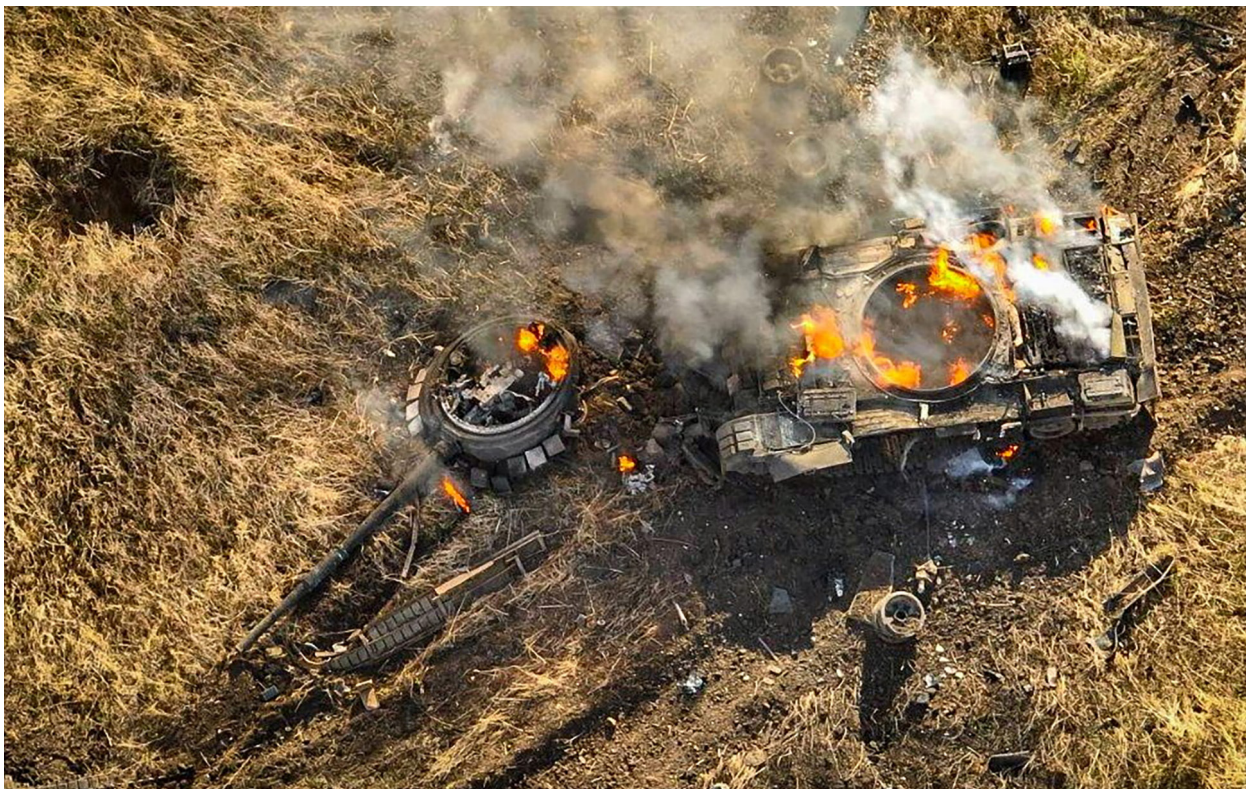
The immediate and urgent objective is changing Russia's assessment that the war could be wrapped up in 2024. Instead, 2024 will be a year of strategic defence for Ukraine – a time to build up the necessary military and industrial base to defeat Russia.

To this end, it is pertinent to support the training of the Armed Forces of Ukraine (AFU) and tailor the defence industrial output accordingly to provide the AFU the artillery, muni-

DEFENCE SPENDING 1992-2022 (% OF GDP)



Defence spending from 1992 to 2022 as share of GDP. Based on information from the Stockholm International Peace Research Institute (SIPRI) Military Expenditure Database, https://www.sipri.org/databases/milex.



Russian tank burns in a field near the town of Vuhledar, 5 November, 2023.

Photo: Press Service of the 72nd Black Zaporozhians Separate Mechanized Brigade of the Ukrainian Armed Forces via REUTERS

tions, UAVs, strike systems, air defences and fighter aircraft required to liberate their territory. Investment in the production of these capabilities at scale is also critical for delivering NATO's strategy for the defence of the Euro-Atlantic Area, and meeting Allied commitments made at the NATO Summits in Vilnius and Madrid.

Most NATO Allies have significantly depleted their already small conventional military stockpiles and capabilities by donating their equipment to Ukraine. The Allies also have a very limited industrial base that is unfit for meeting the security challenges of the 21st century and unable to reconstitute these capabilities unless defence investments are substantially and urgently increased.

This state of affairs is the direct outcome of a decades-long underinvestment in defence. The inability of 20 out of 31 Allies to meet the Defence Investment Pledge to spend at least 2% of GDP is limiting our combined defence budget by €79 billion this year alone[12]. The total deficit since 2014 amounts to more than €920 billion. While the defence budgets in absolute figures have slightly increased throughout most of the past decade, the average yearly growth in real terms[13] among European NATO members and Canada collectively remains around €10 billion – below 1% of NATO's total budget estimate this year.

THE TASK

In order to bring about Russia's defeat in Ukraine, it is necessary for Ukraine and its partners to pursue the following operational objectives:

Circumventing Russian defences by

- severing Russia's ground lines of communication and making resupplying troops (either under the threat of artillery or by air and sea) disproportionately costly and more time-consuming,
- inflicting sustained and increased attrition on Russian forces,
- sea denial to the Russian Black Sea fleet,
- conducting a sustained campaign to degrade Russian Aerospace Forces (VKS),
- training and preparing Ukrainian forces to be able to undertake offensive operations at an increased scale.

Continue to blunt Russian offensive operations

- If undisrupted, Russia has the capacity to train approximately 130,000 troops every six months into cohered units and formations available for launching operations. Additional troops can be mobilised and pushed into Ukraine as untrained replacements, but these do not provide effective combat power.

- The Russian training system can be put under pressure and disrupted by inflicting sustained and increased attrition on Russian units in Ukraine, forcing the newly mobilised personnel to be deployed to the theatre prematurely. This would constrain the Russian training system to deliver approximately 40,000 additional troops instead of 130,000 every six months as cohered units (command and control, artillery, and other critical personnel must be trained to create a unit of action, irrespective of its size). Deployments above this figure would serve as rapidly expendable gap fillers rather than an offensive fighting force.
- The objective therefore should be to inflict a sustained rate of attrition of at least 50,000 killed and severely wounded Russian troops per six months to consistently degrade the quality of Russian force, preventing Russia from regenerating offensive combat power – which Ukraine has so far successfully achieved.
- Additional quantitative and qualitative training of Ukraine's troops, together with the necessary military assistance, will further increase Russia's attrition, forcing Russia to enact full national mobilisation – accelerating the desired attrition rate and increasing the risk of domestic strife for the Russian regime.

A burned Russian tank in Kharkiv region, Ukraine, 2 October, 2022. Photo: EPA

Economic curtailment of Russian defence industrial output to increase the cost and consequences of military attrition

- It is a priority to move from the passive passing of sanctions to their proactive and aggressive enforcement, combined with the use of economic coercion to constrain trade with Russia. The acquiescence of several states with significant exposure to the EU in enabling Russian evasion of sanctions and export controls must be robustly contested.
- Russia's war resources should be diminished by all means. Following the initial effects of measures such as the oil price cap adopted by G7 and the EU, Russia has found ways to successfully circumvent these, returning its oil and gas revenues to a steady increase recently. With the oil and gas sales accounting for more than 28% of Russia's budget proceeds[14], properly targeted and effectively enforced measures can provide a powerful tool for stifling the inflow to Russia's war chest.

Raising the cost of the war of aggression by allocating Russia's confiscated or frozen assets for the benefit of Ukraine

- With more than €330 billion frozen by the international community, of which more than €200 billion are controlled by the EU, it is necessary to create a credible leverage, which would ensure that these funds would not be returned to Russia, unless a full withdrawal from the sovereign territory of Ukraine in its internationally recognized borders is completed and attacks on Ukraine are ceased. Whilst the EU leaders have taken the first steps to use the profits from these assets[15], further ones are needed. Additionally, the implementation of this measure serves as a powerful and credible political and military tool to deter other malign actors in the future.

Ukrainian troops training with howitzers in Estonia, 1 March, 2023. Photo: Estonian Defence Forces, Ardi Hallismaa

Manpower

To enable the Armed Forces of Ukraine to liberate key objectives, it is necessary to provide sufficient training to expand the scale at which the AFU can conduct operations. At present, the AFU are unable to reliably train inside Ukraine above company-level because of the long-range strike threat to training areas. Ukrainian units therefore struggle to operate in a synchronised way in larger formations above a company.

Ukraine's army expanded from 150,000 ground forces to over 700,000 in 2022, while over the course of 2022 there was heavy attrition among experienced field officers and soldiers alike. As a result, AFU brigades lack sufficiently trained staff officers to enact commander's intent and synchronise the actions of sub-units laterally. The effective span of control of a brigade for offensive operations is therefore approximately two companies. The result is that the AFU plans and executes operations with a horizon of exploitation limited to approximately 1200 meters. Furthermore, larger formations are missing or are not structured as combat formations.

By the end of 2023, European training efforts under the EU Military Assistance Mission in support of Ukraine (EUMAM) and the UK-led Operation Interflex will have collectively trained 60,000 Ukrainian troops. With additional training provided by the United States and the greater coalition, the total Western effort since Russia's full-blown invasion in February 2022 has therefore reached close to 100,000 personnel over 20 months. The 30,000-troop European effort is estimated to have cost slightly over €100 million, placing the total cost estimate as low as approximately €350 million (or €3500 per trained soldier).

It is time for us set new objectives, a new pace and a new standard of quality in training Ukrainian troops.

Despite this, the training was set up when Ukraine desperately needed more trained soldiers to defend an extended front. Because speed mattered, and defensive operations are simpler than offensive operations, training was expedited to five weeks. This is not sufficient to prepare soldiers for offensive operations. During the Second World War, British infantry would receive over 20 weeks of training before they were considered basically proficient and the U.S. Army operated with 13-17 weeks of basic training[16]. We must therefore develop our training packages to better prepare our Ukrainian partners for offensive operations.

It is time for us set new objectives, a new pace and a new standard of quality in training

While the needs for basic and specialist training persist, it is a matter of priority to expand the scope of the AFU in order to allow turning overall manpower into an even more lethal fighting power.

Ukrainian troops. In 2024, the aim should be to expand Ukrainian operations from brigade enabled company actions, to the ability to execute brigade attacks. In 2025, the aim should be for the AFU to conduct simultaneous brigade attacks, enabled by larger formations at a joint level.

There are three critical lines of effort in enabling this expansion of the scale of Ukrainian offensive operations:

1. Staff officers need to be trained to work at brigade and battalion levels to plan, synchronise, and control a greater span of battlespace. Leadership courses for field grade officers can contribute towards this, provided that the syllabus taught is tailored to build upon rather than supplant the existing workflow of Ukrainian command posts. Therefore, the syllabi must be drafted based upon the observation of these command posts. Considerable improvements could be brought about in 2024 already, starting with a 10-week training programme building on the skills of an initial cadre of 250 officers, which can enable conducting battalion-plus sized attacks. At the same time, it is highly likely that better training could limit losses among officers, therefore extending the sustainability of Ukrainian forces.
2. Collective training in Europe at a battalion level needs to be expanded and extended to give Ukrainian units that are rotated out the ability to improve their cohesion at echelon. It is critical that exercises at a battalion level would be supported by the necessary policies and permissions to realistically simulate battlefield realities in Ukraine, particularly including the density of unmanned aerial systems (UAS). Repetitions are vital in order to improve tactical battle drills. Cost-wise, a two-week exercise for an infantry battalion costs around €1 million only.
3. At present, Ukrainian fire control systems limit the ability to concentrate fire missions. There is a significant cost to replacing these because personnel knows how to use them. Working with the Ukrainians to continue to develop the command and control tools they employ to increase the scale of effects the AFU can coordinate will be vital if increased manoeuvre forces are to be supported by appropriate fires and electronic warfare.

While the needs for basic and specialist training persist, it is a matter of priority to expand the scope of the AFU in order to allow turning overall manpower into an even more lethal fighting power.

Each of these lines of effort can bring enormous improvement to AFU in support of scaling the reach and effect of its operations, for a modest amount of resources and within a relatively short timeframe. In return, it will provide a highly cost-effective and attainable toolbox for promoting Ukraine's success on the battlefield.

Hardware

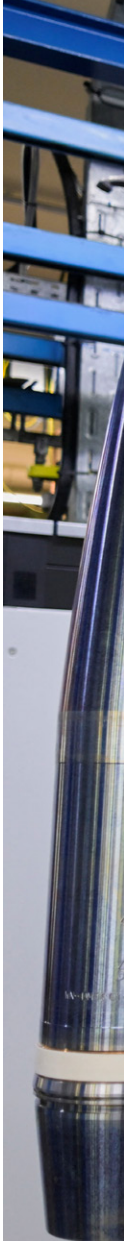
Artillery

For both Russia and Ukraine, artillery is the primary means of destruction of troops. Whoever retains fire superiority retains the initiative. Ensuring the sustainment of Ukraine's fires is therefore critical for both attack and defence.

Europe and the U.S. alike have directed their efforts towards meeting Ukraine's artillery requirements, providing hundreds of platforms along with millions of ammunition rounds in total. Advanced systems such as MLRS and HIMARS, as well as long-range strike missiles have proved crucial in striking operationally significant targets, while the frontlines continue to require a sufficient supply of ammunition for shorter ranges. The EU has delivered around 300,000 out of the one million artillery rounds agreed, in addition to earlier bilateral contributions. The U.S. has provided more than 2,000,000 155mm artillery rounds, complemented by more than a million rounds of other calibres.

Allied 155mm artillery systems outrange equivalent Russian 152mm systems, have a higher rate of fire, and better accuracy. Ukraine

Whoever retains fire superiority retains the initiative.



Meeting Ukraine's minimum demand rate collectively during 2025 would therefore require a European effort of 140% increase over 2024.

requires a minimum of 200,000 rounds per month to retain localised fire superiority. Sustaining this rate of fire will empty European and U.S. stockpiles over 2024 and will require significant foreign purchases of ammunition. Allies can ramp up their munitions production to meet this rate by 2025 at the latest. While transparency on both European companies' current production rates as well as planned increases remains limited, estimates based on public data would place the 2023 rate between 480,000 and 700,000 rounds. Current monthly figures could therefore average at 50,000 rounds, doubling the capacity from early 2023. The U.S. has similarly doubled its monthly production since early 2023, now producing 28,000 rounds per month, and aiming to reach the 100,000 per month rate by end of 2025. Meeting Ukraine's minimum demand rate collectively during 2025 would therefore require a European effort of 140% increase over 2024.

Efforts to increase European production have been stymied by each European state pursuing separate – and relatively small – orders from industry. The business case presented by these orders does not justify defence manufacturers increasing production capacity, because there is no clarity on the scale of orders over time. European Allies and Member States therefore should work together to consolidate orders into larger and longer term contracts that would justify investment in production capacity in the defence industrial base.

Russia's total production and recovery of artillery ammunition will reach 3.5 million units in 2023, representing a more than threefold increase from the previous year's production. In 2024, production and recovery will increase further and would likely reach up to 4.5 million units. This volume significantly exceeds the amount of artillery ammunition available to Ukraine. If the Ramstein coalition is unable to ensure the sufficient increase in ammunition production and supply to Ukraine as a matter of urgency, Russia's advantage in the use of artillery ammunition and thus in the war will increase.

An additional limiting factor so far in the sustainability of Ukrainian fires is artillery barrels. It is assessed that Ukraine will need 1500-2000 barrels per year with each unit costing up to €900,000. Given the limited number of barrel machines, particular focus should be provided for companies to expand barrel manufacturing. The United States and the European Allies need to critically reassess the unsustainable fragmentation that has led to Ukraine using at least 17 different artillery platforms. The goal should be to reduce this number by several times.

Another assurance of Ukraine's fire superiority is to force the dispersal of logistics for Russia's fires through the persistent threat of Guided Multiple Launch Rocket System (GMLRS) strikes. 24 GMLRS rockets per day has been sufficient to achieve the suppression of Russian fires. GMLRS are also vital for the large number of European armies purchasing HIMARS. As a minimum, industrial investment therefore should aim to provide Ukraine a supply of 8760 GMLRS per year by 2025. To date, Lockheed Martin has produced more than 60,000 in total[17], and is aiming to up its current full annual capacity of 10,000 to 14,000 in 2024[18]. With the estimated cost per one rocket approximately €160,000, the total cost of minimum military requirement annually is approximately €1.4 billion.[19]

The targeting of Russia's air defence systems and thereafter targets of strategic significance in depth, including infrastructure, C2 nodes, airheads, and assets of the Black Sea fleet requires the continued provision of long-range strike systems. The effect delivered by the air-launched cruise missile Storm Shadow can be extended via the employment of the air-launched cruise missile Taurus and the Army Tactical Missile System (ATACMS) in the short-term.

While the U.S. continues its long-range precision fires programme (LRPF), by introducing the Army's Precision Strike Missile (PrSM), the Strategic Mid-Range Fires, and the developmental Long-Range Hypersonic Weapon (LRHW), it is equally critical that Europe invests in renewed production of relevant long-range strike systems, such as SPEAR-4 and SCALP-EG.

However, those programmes will also require additional investment and prioritisa-

155mm ammunition production at Rheinmetall plant in Unterlüß. Photo: REUTERS/Fabian Bimmer

tion as they are currently configured around the assumption that rounds would be created by refurbishing and upgrading existing stocks – most of which have since been supplied to Ukraine. To underpin the sustainability of this production for the defence requirements of the Euro-Atlantic Area, the assurance of European access to relevant supply chains is equally necessary. A critical capability in this regard is the manufacture of explosive energetics. There is a strong argument for the EU to pioneer the funding of R&D of new explosive energetics and new methods of manufacturing.

European funding could further support the manufacture of legacy Soviet materiel, including 152mm ammunition and barrels. This could have a significant short term benefit for Ukraine as it would extend the timeframe over which a large number of its own Soviet legacy systems can be used. However, it makes less sense to replace the barrels on these systems.

Refurbishing expired ammunition is another alternative for temporarily mitigating the constraints on new production. It is assessed that the EU could refurbish approx. 15,000 rounds per month. Refurbishment is estimated to be priced at 30-50% of the new ammunition price, while delivery times could be considerably faster. The feasibility of this line of effort depends on the readiness of the countries with stocks of suitable ammunition as well as the availability of components required for the refurbishment process.

Consideration should be given to the extent to which specialised munitions, including sensor-fused munitions and thermobaric payloads, are priorities for production. Although such specifics would considerably increase the cost per munition, they would also reduce the number of rounds the AFU must fire to deliver the necessary scale of effect. Yearly production rates of such munitions currently remain very limited, but increasing these capacities would concurrently allow Allies to better meet NATO's future requirements.

MLRS artillery training in Estonia. Photo: Estonian Defence Forces, Jarkko Martin Pukki

Unmanned Aerial Vehicles

The most efficient means of maximising the situational awareness of the force and the accuracy of artillery are Unmanned Aerial Vehicles (UAVs).

The demand for UAVs is ubiquitous, with a density of approximately two per platoon of infantry deployed, three per artillery battery, and five per battalion command post. The sophistication and requirements for UAVs increase by echelon as the area of interest extends further into the enemy deep. All classes of UAVs have a limited life expectancy. Tactical systems at the platoon level may last half a day; long-range UAVs often have a lifespan of up to 16 flight hours. The demand for UAVs at all levels is constant and increasing.

Both Russia and Ukraine are heavily dependent upon Chinese DJI UAVs. Having conquered the civilian market, DJI benefits from a sufficient economy of scale to produce the necessary number of airframes at a viable price point. NATO manufactured UAVs are often just as effective as DJIs, but are orders of magnitude more expensive because they are produced at small scale, for limited numbers of orders and almost exclusively for military customers.

For NATO members to meet Ukraine's and their own needs for UAVs in conflict and to have a resilient supply chain to build them, it is necessary for Europe to make a simple platoon UAV at scale. The aim should be to produce 5000 per month at a price below €2500 per unit (€150 million annually). These same UAVs should be used to compete with DJI on the civilian market, while regulatory measures should also be explored, as the manufacturer's collection of vast amounts of data across European civilian and military enterprises is a threat to national security[20].

In addition, European NATO members must collaborate to scale the production of fixed wing UAVs with a range beyond 80 km that are able to transmit data in real time and reliably fly in a dense electronic warfare (EW) and GPS-denied environment. This should be able to operate day or night, have a modular payload, and fly

No UAV should therefore be seen as a finished product, but must instead be understood as an evolving capability.

at medium altitude. It should be producible at a unit price below €200,000 and in volumes of at least 3168 airframes per year (€633.6 million annually).

Although basic designs that can be scaled are important, it is also vital that the sensors and software enabling UAVs to fly can be iteratively updated to stay ahead of counter-UAV capabilities. No UAV should therefore be seen as a finished product, but must instead be understood as an evolving capability. For this reason, the UAV should have an open architecture and contracts should avoid capture by a single company to manage the updates of its software and payloads.

If UAVs are able to iteratively develop, then it is necessary to have a regulatory environment where each alteration to the UAV does not require recertification of its airworthiness. Furthermore, if the regulatory threshold for a UAV to fly remains comparable to an aircraft, then it is unlikely that a competitive price point or the required agility can be met as the overheads in production become too onerous. It is therefore critical for NATO countries to develop legislation to enable a competitive UAV industry.

The development of one-way attack UAVs will likely remain more fragmented, because it is precisely in the diversity of threats and their operating logic that such capabilities retain their effectiveness. Scaling such capabilities is persistently difficult because of the development of hard and effective counters by the adversary.

Ground-Based Air Defence

The exhaustion of Ukraine's air defence system would enable the Russian Aerospace Forces (VKS) to bomb from medium altitude and decisively shift the balance of advantage in the war. Allies have already provided Ukraine various air defence systems, such as the Patriot, Hawk, IRIS-T, NASAMS, and Gepards. Yet, as Russia continues to focus its efforts on effectively wearing out Ukraine's air defence assets, it is crucial that partners help make Ukraine's Ground-Based Air Defence (GBAD) sustainable.

Russia has significantly expanded the production of various long-range strike systems. This includes stockpiling approximately 1500 Shahed one-way-attack UAVs, now produced in Russia, alongside cruise missiles, ballistic missiles and aero-ballistic missiles[21]. In October 2022, it was producing approximately 40 such systems per month. A year later it is now producing approximately 100. Production could reach 200 strike systems per month over 2024. With intercepts usually requiring the launch of two interceptors, this suggests that there is a sustained demand trending towards 400 interceptors per month as a requirement, noting that some missiles will get through undefended sectors, and some will be shot down by other systems such as man-portable air-defence systems (MANPADS).

Russia has had very little success in its periodic efforts to destroy Ukrainian long range surface-to-air missile (SAM) systems, so the bulk of Ukraine's upgraded Soviet-origin S-300 systems remain intact. However, ammunition stocks are heavily depleted. Efforts by Ukraine's partners to source additional SAM ammunition for the S-300 from third party nations around the world have been essential to sustaining air defence coverage. Ukraine's partners should assist the local defence industry in producing these interceptors.

Ukraine's SA-11 'Buk' and SA-8 'Osa' tactical SAM systems are the reason why Russia has not been able to establish air superiority and defeat Ukraine. As with S-300, there is also a shortage of ammunition. Acquiring additional missiles for Ukraine's SA-11 'Buk' systems should be a short-term priority to manage the transition to other systems. European allies need to continue to support efforts to develop and integrate alternative ammunition for existing SA-11 launchers, such as Hawk missiles of which there remain significant stocks.

The U.S. is addressing this gap with its so-called FrankenSAM project[22], designed to combine elements of Western and Soviet systems into operative air defence assets, such as Western-calibre surface-to-air missiles with refitted Soviet-era launchers or radars. While the project is limited in scope due to its experimental nature, the pilot successes have reached

NASAMS ground-based air defense system at exercise Saber Strike, 15 March, 2022.
Photo: Estonian Defence Forces, Karl Kraus

the front lines and suggest the efforts are worth continuing. Further European options should be explored.

As expected, the Patriot system supplied to Ukraine in late 2022 has performed exceptionally well against cruise and ballistic missiles. It will be critical for defeating Iskander and Kinzhal missiles. However, the number of batteries is still limited and can only provide coverage over a few key areas at any given time. With competing demands from the Indo-Pacific and the Middle-East theatres, the production is limited and ammunition demand is substantial. To date, Raytheon has produced over 240 systems[23] and the company is poised to increase annual production to 12 systems total, with one battery costing approximately over €1 billion[24].

To help alleviate this bottleneck, European nations should substantially invest in the increased production capacity of launchers, radars and interceptors for complementary systems such as SAMP-T, NASAMS, Sky Sabre, Narew, and IRIS-T SLM, which are also highly effective against most Russian missile types and can reduce the pressure on Patriot and S-300 over time.

European states should also manufacture and supply additional NASAMS and IRIS-T short and medium-range (SLS and SLM) systems to allow these to be used more in the tactical role near the frontlines, slowly replacing the Buk and Osa systems that currently form the backbone of tactical air defence for the AFU.

European nations should substantially invest in the increased production capacity of launchers, radars and interceptors

Current European production capacity of the required systems remains very limited in both quantity and speed: based on narrow public sources, annual production figures per system are still in single-digit figures[25], while delivery and replacement times exceed years[26].

Ground-based air defence systems are also critically needed to improve NATO's own air and missile defence, so significantly enhanced production capacity would almost certainly be utilised for some time even after the conflict and decrease unit costs for NATO nations.

Fighter Aircraft

Ultimately, Ukraine will need to supplement its air defences with defensive counter air (DCA) sorties by the Ukrainian Air Force. The Ukrainian Air Force will therefore need Western Fighter Aircraft by 2025 to sustain DCA.

The Netherlands, Denmark, Norway and Belgium have already committed to donating F-16 fighter jets to Ukraine. While the total number of the jets is undisclosed, the first deliveries are scheduled to take place before the end of this year, with additional ones spread over 2024 and 2025. A number of Allies will contribute to Ukrainian pilots' training, lasting

Gripen fighter jets. Photo: Estonian Defence Forces, Karl Möls

between five to eight months[27]. Beyond flight training, the F-16s require significant logistics and maintenance training for ground support personnel to ensure that the aircrafts remain combat capable, as well as appropriate equipment and infrastructure for operating and maintaining the fighters.

Considering additional possibilities of the Euro-Atlantic fleet, Gripen C/D could be a suitable platform to be supplied alongside the longer-term F-16 plan.[28] Gripen was designed for efficient dispersed multirole operations against Russian forces, while fighting outnumbered from relatively rough dispersed locations. As such, it is designed to be serviced, refuelled and rearmed on road bases by teams of five conscripts with 2-3 months training led by a single more experienced supervisor, using universal tools carried on two light vehicles – therefore, requiring less to enable Ukrainian teams to operate the jets rapidly in-country. Gripen can carry and fire an effective European-produced Meteor air-to-air missile.

With this longer ranged missile capability (and internal electronic warfare suited for self-defence), Gripen would allow Ukrainian pilots to be effective in smaller numbers as a deterrent to Russian aircraft near the front, since they would not have to rely on more complex tactics in large, self-supporting formations. For achieving DCA capacity, Ukraine would need 20 aircraft for two squadrons of eight each, to fly 2x two-ships per day, plus four reserves/attrition replacements. The total cost estimate for the aircraft would be around €3 billion, with additional export agreement and supply from European Meteor partner nations.

Maintenance, Repair and Recovery

Maintenance of equipment, its recovery, and repair are all key factors to the sustainability of the force. This line of effort gains particularly critical importance during the upcoming months, while

F-16 fighter jets. Photo: Estonian Defence Forces, Ardi Hallismaa

coalition donations of new equipment narrow down due to increasingly limited stocks, and as additional production has not yet picked up the necessary pace at scale to meet the supply needs.[29] Expanding the training to maintain donated systems and to avoid cannibalisation, where possible, will therefore be important in increasing the availability of key systems at the front.

BRACING UKRAINE AND OURSELVES

The world continues to witness the courageous fight of the Ukrainian people and its Armed Forces against Russia's brutal war of aggression. The international community has come together in an unprecedented unity of effort by supporting Ukraine with military, humanitarian and economic assistance and by imposing sanctions against Russia.

Allies signing the "Tallinn Pledge" to deliver more military aid, including the first long-awaited main battle tanks for Ukraine at Tapa Army Base, 19 January, 2023. Photo: Estonian Ministry of Defence

Ukraine's victory remains our shared goal, enforcing the lesson that aggression will never pay off and will always backfire.

Ukraine's resistance has been greatly empowered by the European and American weapons that conjointly have squashed the Kremlin regime's dreams of a quick and easy military victory, decimated some of the best units of the Russian Armed Forces, and liberated sizeable parts of Ukraine's occupied territories. The arsenal of democracy is fulfilling its mission in Ukraine's hands.

Ukraine's victory remains our shared goal, enforcing the lesson that aggression will never pay off and will always backfire. The Kremlin regime is sorely mistaken in its belief that by gearing for a multi-year conflict and by switching to a war-time economy, they could outlast and outperform us. In fact, Russia has yet to see our real strength.

Collectively, we can and we will win the war of attrition against Russia. We can pave the way for the Ukrainian Armed Forces to defeat Russia militarily, provided that we start building now. Together, it is affordable and viable.

2024 will provide a building year for beefing up Ukraine's manpower and lifting the production volumes of critical equipment and ammunition to required levels. This will put Ukraine in a position of strategic defence.

The current stance on the battlefield enables a shift into positional warfare that would favour Ukraine. Complemented by precision strikes into Russia's depth – targeted at wearing out Russia's command and control, logistics and a variety of operationally significant targets –, will allow Ukraine to limit the attrition rate, reconstitute its forces, ration systems and supply, while keeping Russia at bay. Even as it would provide Russia time to bolster its own efforts, it will lack the necessary offensive power for decisive action.

By 2025, the collective efforts in support of Ukraine will have provided a sufficient increase of critical skills, capabilities and stockpiles for Ukraine, unlocking the power for inflicting the required level of attrition on Russia. Concurrently, it will send a powerful deterrence message to any state or non-state actor globally of what the real cost of aggression against the Euro-Atlantic community will be.

CONCLUSION: A STRATEGY OF SUCCESS

The success that allows NATO to celebrate its 75th anniversary in 2024 was shaped in the vast battlefields of Europe and the Pacific by shared values, tremendous sacrifices and immense

resources – a battle of wills on a scale unprecedented in contemporary history.

Similarly, the outcome of Russia's aggression war will be a defining moment for the future of Ukraine and the Euro-Atlantic area. Anything short of Ukraine's victory – whereby its desired sovereignty and territorial integrity is respected – will be a strategic and costly mistake that will reverberate across the world. It will set a dangerous blueprint and opportunity for adversarial powers to challenge us again.

At a time when freedom is on the line, the sacrifices of the greatest generation must not only be remembered, but fundamentally defended. To date, all members of the Euro-Atlantic community have given some, but a lot of Ukrainians have given their all.

With its enduring strategic objectives set on redrawing the map of Europe, including by re-establishing spheres of influence and recreating buffer zones, the Kremlin regime questions the very existence of Ukraine and threatens NATO. Russia will rebuild its military posture to achieve its aims and, depending on the outcome of the fighting in Ukraine, could have significant conventional forces, supported by a fully mobilised defence industry, in a position to threaten European security in the very near-term.

Effectively, committing merely 0.25% of GDP annually towards military assistance to Ukraine would provide approximately €120 billion – more than sufficient resources to implement this strategy.

Setting transatlantic defence up for success against this threat requires a renewed political will and resource commitment, worthy of the past and present sacrifices. Effectively, committing merely 0.25% of GDP annually towards military assistance to Ukraine would provide approximately €120 billion – more than sufficient resources to implement this strategy.

It is only appropriate that this would be agreed upon at the level of Heads of State and Government under the auspices of the Ramstein coalition.

An amputee in uniform inspects the flags placed on Independence Square in commemoration of fallen Ukrainian soldiers, Kyiv, Ukraine, 30 October, 2023. Photo: AFP/Sergei Supinsky

Ukrainian President Volodymyr Zelensky (centre rear) joins G7 world leaders at a working session on the final day of the G7 Summit in Hiroshima, Japan, 21 May, 2023. Photo: Stefan Rousseau/PA Images/Alamy

Having trained close to 100,000 Ukrainian fighters for the total cost of approximately 350 million euros only, there is ample capacity to scale up training, but even more so – increase and focus on setting and implementing new qualitative targets to the Armed Forces of Ukraine to fight properly at battalion, brigade and higher echelon levels.

While not an exhaustive list, this strategy identifies and sets the required production volumes for artillery, UAVs, ground-based air defence, fighter aircrafts, and the associated stocks of ammunition as the most significant capabilities that shape the battlefield. A unity of effort is required to consolidate, coordinate and ramp up overall production of existing capabilities to desired levels. Capability coalitions being formed within the Ramstein group are already laying down important groundwork in several priority areas.

Ukraine has succeeded in killing or severely wounding at least 50,000 Russian troops per every six months on the battlefield. By redoubling our military support efforts, the attrition pace of Russian manpower and particularly the associated military equipment is bound to accelerate to unsustainable levels for Russia, whilst simultaneously decreasing Ukraine's attrition.

> The increased investment commitments into defence will directly translate into accelerated and expanded defence-industrial output.

From a historic and strategic perspective, this cost to the Euro-Atlantic community of further arming and training Ukraine and accelerating investments into defence is both affordable and sustainable. The defeat of Russian forces in Ukraine and the maximal attrition of its military is also a direct means of lowering the threshold of what is needed to achieve conventional deterrence in Europe. And lastly, the increased investment commitments into defence will directly translate into accelerated and expanded defence-industrial output that is urgently required to address the threats and adversarial powers across the globe.

Guided by this reinforced vision and strategy, 2024 will be a year of strategic build-up and defence for both Ukraine and the Euro-Atlantic community. It will continue to systematically attrite Russian economy, finances, manpower and equipment, before the pace and outlook of defeat for Russia will rapidly accelerate through 2025 as the United States' and Europe's defence-industrial output reaches new levels. With that ever-growing and strengthening resolve, Ukraine will indeed win and Russia will lose by 2026 the latest.

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Back cover: Wreckage of war, destroyed homes and burned tanks in the streets of Irpin and Bucha, suburbs of Kyiv, Ukraine, 3 April, 2022. Photo: Carol Guzy/ZUMA Press Wire


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